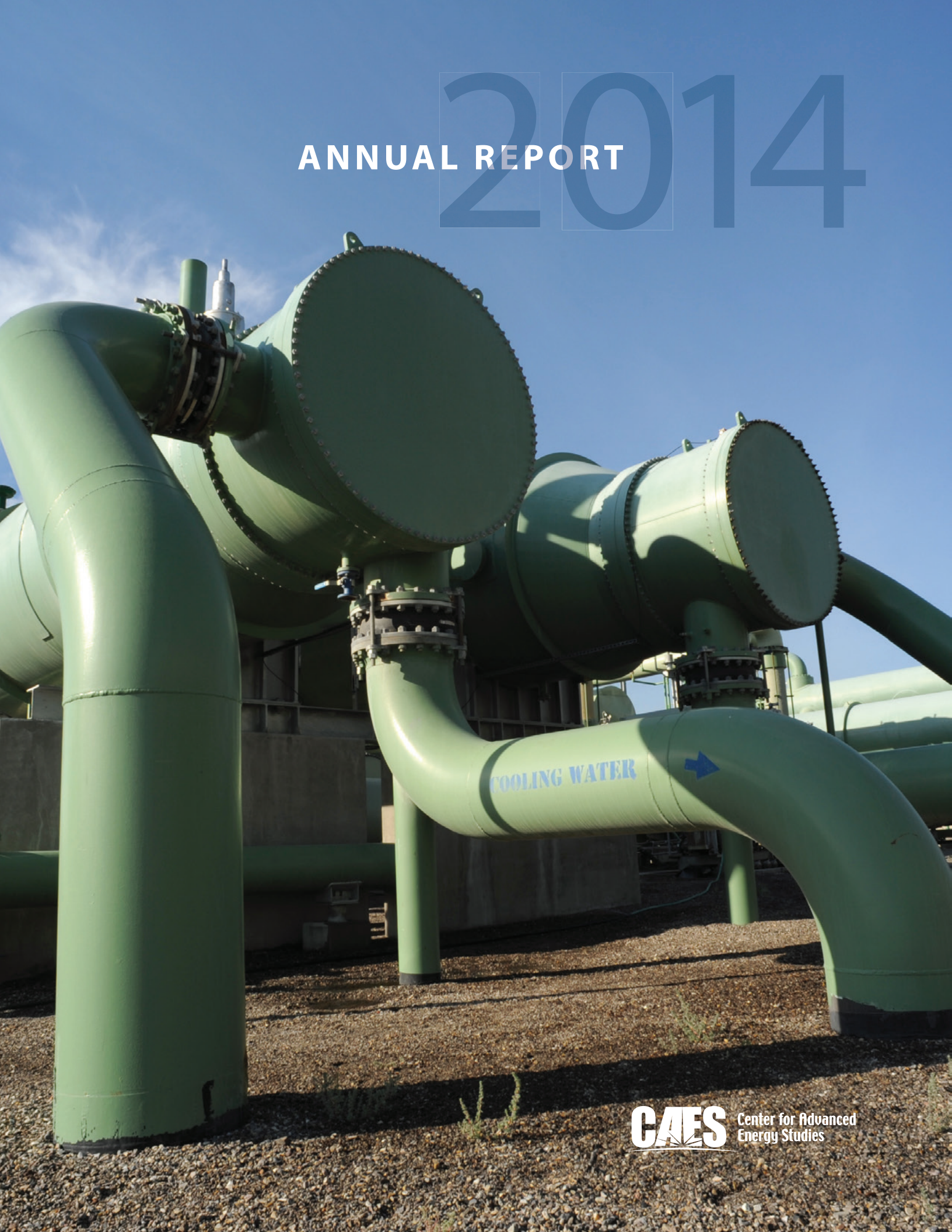
ANNUAL REPORT 2014



CAES Center for Advanced Energy Studies

"CAES provides a portal for industry to gain access to multidisciplinary capabilities and expertise that exist at the member institutions."

Cover photo:
Raft River Geothermal Plant in Southern Idaho

Message from the Director:

Within two decades, we will likely be faced with a global population of over 9 billion people. Competition for food, water, minerals, commodities of all sorts, and energy – the very heart of our economic engine and quality of life - will grow substantially. Our environmental and natural systems will continue to show impacts of this strain. Global market opportunities and risks will change markedly. And in our country, we will continue to experience a substantial transition in the way we produce, distribute, consume, and think about energy.

This means opportunity and risk for our region and our country. Meeting these challenges will require new, powerful business models to create impactful collaboration between industry, academia, and government to help shape this new world, to help our workforce compete, and to help our industries tap rapidly changing global markets. These collaborative models are absolutely necessary to compete and influence – leverage will be key. The Center for Advanced Energy Studies (CAES) is just such a model.

Since it was established in 2005, CAES has become a powerful example of how universities and national laboratories can effectively leverage each other's capabilities to generate more impactful research; educate a new generation of science, technology, education and math research professionals; help our industries solve pressing problems; and increase the region's energy IQ by providing the facts and information necessary to make informed choices regarding energy and natural resources.

As CAES moves forward and continues to grow, we will focus even more on providing research capability, leadership-class infrastructure, talent, partnerships, and new business models for collaboration that will help the region's businesses be more competitive in this rapidly changing world.

Sincerely,

Steven Aumeier
Director, Center for Advanced Energy Studies

FY 2014 | By the Numbers

Stemming from a $2 million state of Idaho investment, in FY 2014 CAES derived a 10:1 return on the State's investment.

INFRASTRUCTURE AND OPERATIONS FUNDING

4.6

$ MILLION

RESEARCH PROGRAM FUNDING

15.5

$ MILLION

GRADUATE STUDENTS SPONSORED BY CAES-RELATED PROJECTS

860

NUMBER OF UNDERGRADUATE STUDENTS SUPPORTED BY CAES-RELATED PROJECTS

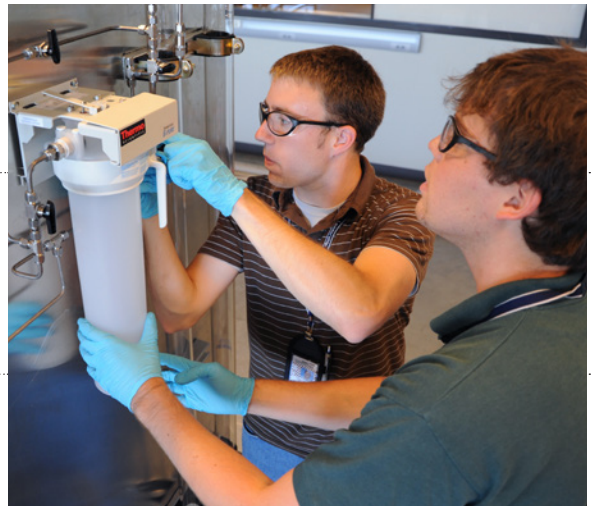
1,383

NUMBER OF VISITORS TO THE CAES COMPUTER-ASSISTED VIRTUAL ENVIRONMENT (CAVE) 3-D DATA IMMERSION RESEARCH ENVIRONMENT

2,660

THREE HUNDRED SEVENTY TWO

NUMBER OF GRADUATE DEGREES FROM CAES-RELATED ACTIVITIES



**NOTE: University of Wyoming numbers are not included in these calculations because they joined the CAES consortium at the beginning of FY 2015.*

346

NUMBER OF HOURS THE CAES MICROSCOPY AND CHARACTERIZATION SUITE (MaCS) WAS BOOKED FOR USE IN FEBRUARY 2013

787

NUMBER OF HOURS MaCS WAS BOOKED IN JUNE 2014

18

AVERAGE NUMBER OF HOURS MaCS IS BOOKED PER DAY

Regional Leadership

CAES collaborates with its consortium members but also serves as a leader throughout the region and nation with industry, educational institutions at every level, and the community. The expertise of its researchers propels CAES as a regional leader in areas such as bioenergy, nuclear research, advanced vehicles and environmental sustainability. Our objective: help drive global competitiveness through regional excellence.

OLD MAIN ON THE UNIVERSITY OF WYOMING CAMPUS.

Wyoming Cowboys join Idaho Universities

In October 2014, the University of Wyoming joined the CAES consortium, becoming the fifth member institution along with founding consortium members Boise State University, Idaho National Laboratory, Idaho State University, and University of Idaho. The University of Wyoming brings expertise in high-performance computing, subsurface water science, petroleum engineering, geophysics, energy and natural resource policy, economics and law, fossil energy systems, and materials science and related research. Their School of Energy Resources has strong partnerships with the energy industry that will allow CAES members access to a broader range of research and development funding opportunities, greater impact on regional economic development, and help all consortium members be more competitive.

University of Wyoming · Boise State University · INL Idaho National Laboratory · Idaho State University · University of Idaho

DID YOU KNOW?

FEDERAL RESEARCH AND DEVELOPMENT EXPENDITURES THROUGH THE UNIVERSITY OF WYOMING TOP $57.4M.

Intermountain Energy Summit

CAES also participated in the inaugural Intermountain Energy Summit. The summit was headlined by U.S. Energy Secretary Ernest Moniz, and featured an array of national and international speakers including Nuclear Regulatory Commissioner Kristine Svinicki, U.S. Congressman Mike Simpson, Alberta Representative to the United States David Manning and Former Montana Governor Brian Schweitzer. CAES hosted the summit reception, which included speakers such as Idaho Lt. Governor Brad Little, University of Idaho Vice President of Research Jack McIver, and CAES Director Steve Aumeier. Twelve CAES personnel along with two CAES students and 58 representatives from CAES consortium member institutions attended and participated in the summit.

CAES DIRECTOR OF PROGRAM DEVELOPMENT MICHAEL HAGOOD BRIEFS U.S. ENERGY SECRETARY ERNEST MONIZ, IDAHO GOVERNOR OTTER, U.S. ASSISTANT SECRETARY FOR NUCLEAR ENERGY PETE LYONS, AND OTHER KEY DECISION MAKERS ABOUT THE CAES REGIONAL LEADERSHIP EFFORTS.

INTERMOUNTAIN ENERGY SUMMIT

Meetings and Workshops

In 2014 CAES organized and hosted more than a dozen meetings that attracted researchers from across the region and the nation:

- Two Mining Workshops with the University of Minnesota
- American Society for Microbiology Conference
- International Symposium on Subsurface Microbiology
- Two workshops on Motor Operated Valves for Nuclear Regulatory Commission Inspectors
- Multiple workshops for the PVMapper software
- Small Modular Reactor Workshop
- SedHeat Incubator Workshop for the Idaho Thrust Belt Prospect
- Energy Storage and Ion Conducting Materials Workshop
- National Science Foundation Proposal Workshop
- FORGE Workshop
- Sedimentary Basin Geothermal Systems Workshop
- Sustainable Western Dairy and Energy Flow in Dairies Workshop
- Energy Policy Research Conference
- Industrial Control System and Critical Infrastructure Security Workshop

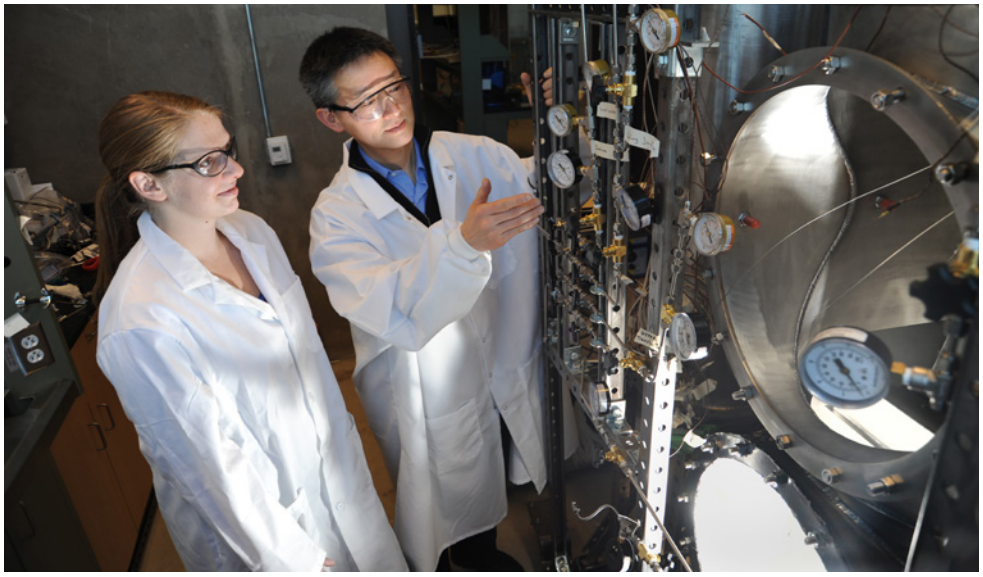
Leading in Research and Development

CAES Consortium Members Won More than $3.7M in Nuclear Energy Research and Development

In August, Boise State University, Idaho State University, and Idaho National Laboratory won $3.7M of the $67M worth of Nuclear Energy University Programs (NEUP) grant awards to support nuclear energy research and development (R&D) projects and nuclear energy enabling technology (NEET) infrastructure improvements and research and development capabilities:

2014 NEET R&D AWARDS	$1,000,000	IDAHO NATIONAL LABORATORY ENHANCED MICROPOCKET FISSION DETECTOR FOR HIGH TEMPERATURE REACTORS
	$980,804	BOISE STATE UNIVERSITY NANOSTRUCTURED BULK THERMOELECTRIC GENERATOR FOR EFFICIENT POWER HARVESTING FOR SELF-POWERED SENSOR NETWORKS
2014 NEET INFRASTRUCTURE AWARDS	$635,910	IDAHO NATIONAL LABORATORY THREE-DIMENSIONAL COMPUTED TOMOGRAPHY FOR ADVANCED INSTRUMENTATION IMAGING
	$592,783	IDAHO NATIONAL LABORATORY NUCLEAR FUELS AND MATERIALS CHARACTERIZATION ENHANCEMENT AT IDAHO NATIONAL LABORATORY (EQUIPMENT FOR MaCS LAB)
2014 NEUP R&D AWARDS	$400,000	IDAHO STATE UNIVERSITY EXPERIMENTAL BREEDER REACTOR II BENCHMARK EVALUATION
2014 NEUP INFRASTRUCTURE AWARDS	$91,741	IDAHO STATE UNIVERSITY REACTOR LABORATORY INSTRUMENTATION AND PHYSICAL FACILITY

CAES RESEARCHERS CHECK TEMPERATURE AND PRESSURE ON AN EXPERIMENT IN THE CAES FLUIDS LABORATORY.



Researchers at Boise State University, in collaboration with Idaho National Laboratory and GMZ Energy, Inc., are working to develop highly-efficient and reliable thermoelectric generators (TEGs) for wireless, self-powered sensors that will utilize thermal energy from nuclear reactors or fuel cycle. The project will identify suitable hot surfaces for TEG implementation, develop a TEG prototype, and study the radiation effect on TEG properties and performances. The research will improve the safety and reliability of nuclear power plants and spent fuel storage facilities, plus significantly expand the existing partnership between Boise State University, national laboratory, and industrial collaborators, and will provide opportunities to train and educate graduate students.

RESEARCHERS PERFORM SAMPLE PREPARATION IN THE CAES MaCS LAB.

The potential improvements can be compared to the difference between an X-ray image and a CAT scan.

Real-time Monitoring of Nuclear Fuel 'Crash Tests'

Just as new car designs are crash-tested for safety, new nuclear fuel concepts need to be tested in a controlled environment to learn how they respond to accident conditions. Idaho State University is part of a research team (led by the University of Wisconsin and including Idaho National Laboratory, Kansas State University, the Ohio State University and CEA-Cadarache) working to design, develop and demonstrate next-generation monitoring systems. Combined with real-time data from state-of-the-art sensor instrumentation developed at the Idaho National Laboratory, scientists will have more detailed, higher-resolution information about what happens inside a reactor than ever before. The potential improvements can be compared to the difference between an X-ray image and a CAT scan. Yet the new research project is aiming even higher, striving for innovations that could provide resolution akin to that in an MRI.

RESEARCHERS TEST NUCLEAR INSTRUMENTATION AND TEST-RIG SURVIVABILITY AT INL'S HIGH TEMPERATURE TEST LABORATORY.

Sustainable Dairy Operations

The University of Idaho led a CAES-sponsored Sustainable Western Dairy and Related Industries Workshop to discuss research strategies and activities, and identify issues limiting western dairy and food systems advancement. The workshop brought together representatives from universities, the private sector, and government and non-governmental organizations to work together road-mapping multi-institutional research and education strategies.

CAES researchers continued to study the use of algae-related technologies – using waste streams from digesters at dairies – to further production of biofuels from nutrients in effluents from digesters. The goal of the project is to develop integrated waste utilization processes targeting dairy manure for production of multiple value-added commodities (biofuel, bio-power, and bio-plastics).

CAES researchers continued to study the use of algae technologies to further production of biofuels from nutrients in effluents from digesters.

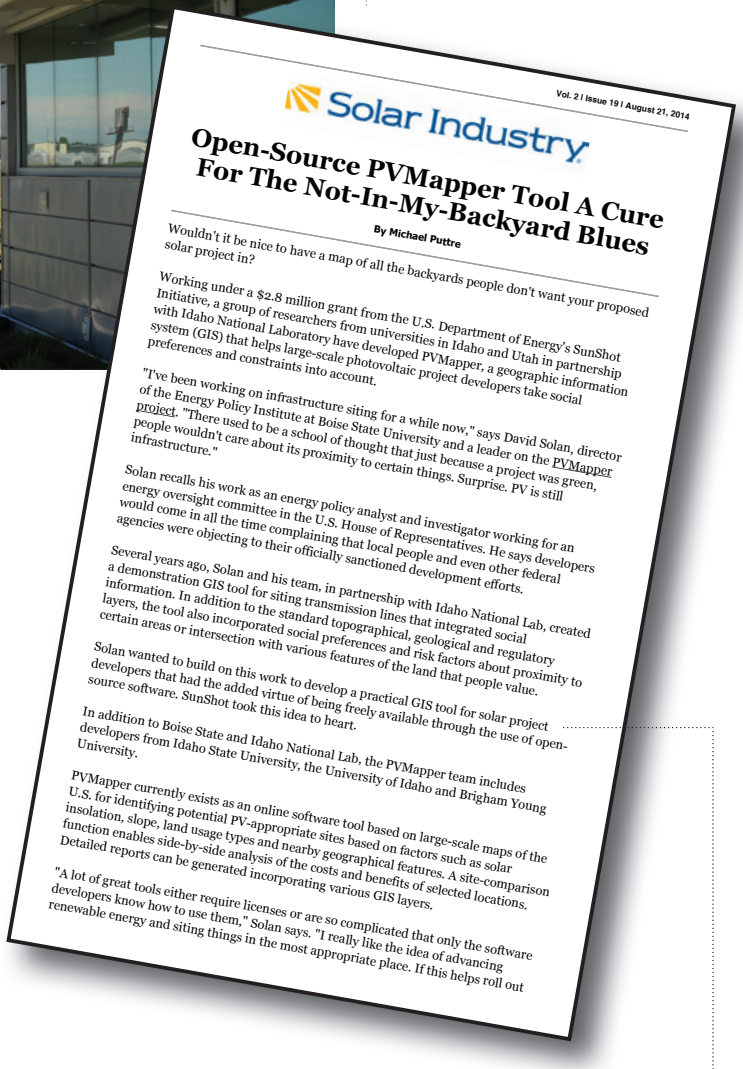
GLANBIA CHEESE INNOVATION CENTER, TWIN FALLS, IDAHO, LEFT. BIG SKY WEST DAIRY, GOODING, IDAHO, BELOW.

A Future with Geothermal

Through a CAES Geofluids Energy Science project, researchers are studying cooling in fractured geothermal reservoirs and developing software tools for geothermal resource assessment. The goals of this project are to evaluate long-term cooling behavior in geothermal reservoirs and its feedbacks on fluid flow, and test reservoir cooling predictions based on commonly used tracer analysis methods against more realistic analytical solutions. CAES was the first institution to upload data into the National Geothermal Data System.

CAES RESEARCHERS DESIGNED AND CONSTRUCTED A GEOTHERMAL FIELD SAMPLING UNIT AND USED IT TO SAMPLE 70 GEOTHERMAL WELLS AND SPRINGS IN SOUTHEAST IDAHO.

SOLAR PANELS AT THE IDAHO FALLS CAES FACILITY.



Solar Industry

Vol. 2 | Issue 19 | August 21, 2014

Open-Source PVMapper Tool A Cure For The Not-In-My-Backyard Blues

By Michael Puttre

Wouldn't it be nice to have a map of all the backyards people don't want your proposed solar project in?

Working under a $2.8 million grant from the U.S. Department of Energy's SunShot Initiative, a group of researchers from universities in Idaho and Utah in partnership with Idaho National Laboratory have developed PVMapper, a geographic information system (GIS) that helps large-scale photovoltaic project developers take social preferences and constraints into account.

"I've been working on infrastructure siting for a while now," says David Solan, director of the Energy Policy Institute at Boise State University and a leader on the PVMapper project. "There used to be a school of thought that just because a project was green, people wouldn't care about its proximity to certain things. Surprise. PV is still infrastructure."

Solan recalls his work as an energy policy analyst and investigator working for an energy oversight committee in the U.S. House of Representatives. He says developers would come in all the time complaining that local people and even other federal agencies were objecting to their officially sanctioned development efforts.

Several years ago, Solan and his team, in partnership with Idaho National Lab, created a demonstration GIS tool for siting transmission lines that integrated social information. In addition to the standard topographical, geological and regulatory layers, the tool also incorporated social preferences and risk factors about proximity to certain areas or intersection with various features of the land that people value.

Solan wanted to build on this work to develop a practical GIS tool for solar project developers that had the added virtue of being freely available through the use of open-source software. SunShot took this idea to heart.

In addition to Boise State and Idaho National Lab, the PVMapper team includes developers from Idaho State University, the University of Idaho and Brigham Young University.

PVMapper currently exists as an online software tool based on large-scale maps of the U.S. for identifying potential PV-appropriate sites based on factors such as solar insolation, slope, land usage types and nearby geographical features. A site-comparison function enables side-by-side analysis of the costs and benefits of selected locations. Detailed reports can be generated incorporating various GIS layers.

"A lot of great tools either require licenses or are so complicated that only the software developers know how to use them," Solan says. "I really like the idea of advancing renewable energy and siting things in the most appropriate place. If this helps roll out

PVMAPPER

PVMapper

CAES researchers (Boise State University, Idaho State University, Idaho National Laboratory and the University of Idaho) along with researchers from Brigham Young University participated in DOE's SunShot Initiative to develop PVMapper, a geographic information system (GIS) that helps large-scale photovoltaic project developers consider social preferences and constraints in their planning. Featured in "Solar Industry Magazine," PVMapper is an online software tool based on large-scale maps of the U.S. that developers are working to make usable across the nation.

"Solan wanted to build on this work to develop a practical GIS tool for solar project developers that had the added virtue of being freely available through the use of opensource software. SunShot took this idea to heart."

Heavy Vehicle Simulator Helps Increase Fuel Efficiency

A new Heavy Vehicle Simulator (HVS) in CAES is helping increase safety and fuel efficiency. The HVS is a full-scale simulator that builds on the first-generation virtual bus simulator (Vbus) research and simulation developed by CAES researchers.

The new simulator is built inside a 6,000-pound front-end cab of a real bus donated by Motor Coach Industries. It is akin to a flight simulator, which recreates a flight environment for pilot training. Drivers can turn the steering wheel, adjust the dashboard and press on the brakes and gas pedal as though it were a real bus. Views of streets and highways are projected onto the bus windshield for drivers to operate under realistic conditions. The video display simulates actual driving conditions, using accurate latitude and longitude, and a GPS locator. The simulator helps develop models of the most efficient driving behaviors for safety and fuel usage in various road and weather conditions.

Along with industry, two academic partners – the University of Idaho and Virginia Commonwealth University – are involved with the HVS project and advancements will continue to be made toward the improvement of predictive driving tools for safety and efficiency.

VBUS – THE ORIGINAL BUS SIMULATOR DEVELOPED BY CAES RESEARCHERS, BELOW.

NEW, FULL-VERSION HEAVY VEHICLE SIMULATOR, RIGHT.

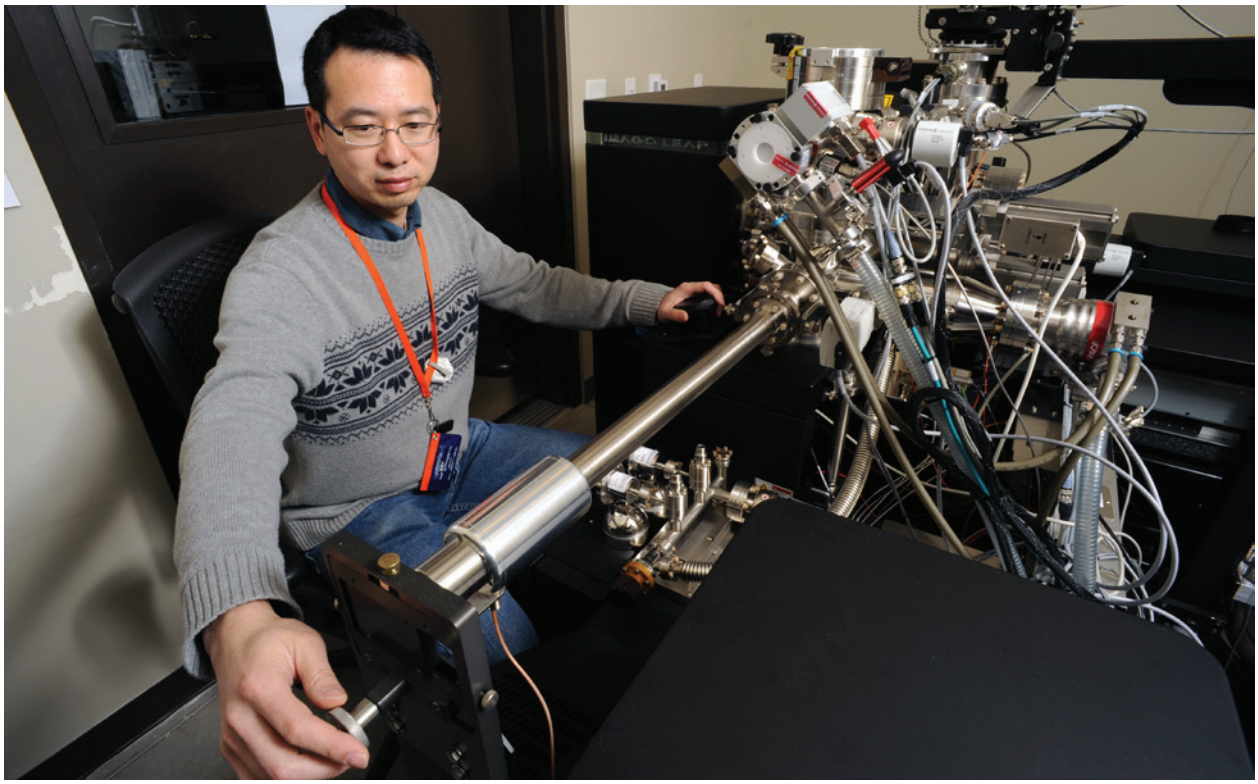
DR. YAQIAO WU LOADS A SAMPLE INTO THE LOCAL ELECTRODE ATOM PROBE AT CAES.

CAES Research Helps Solve Ancient Archaeological Mystery

The MaCS Lab in CAES is widely known as one of the top nuclear fuels and materials research labs in the world, but researchers at CAES saw the potential for a new application - solving an ancient archaeological mystery.

Using a variety of electron microscopes and a Local Electrode Atom Probe, CAES researchers are helping determine the identity of the "Bearded Man, 170-180 A.D.," a Roman-Egyptian whose portrait adorned his sarcophagus. The researchers are working with a tiny sliver of wood – smaller than a human hair – from the portrait. The team of researchers has extracted several needle-tip sized fragments 20 nanometers wide as well as two thin foils. From that, they have been able to analyze and map the chemistry of the material in three dimensions.

The project is ongoing and the investigation continues, but researchers have already determined the pigment is synthetic and may have been created using a technique that historians thought was not developed until hundreds of centuries later. The data is being analyzed by researchers from the Detroit Museum of Art and their results may provide even more information about the Bearded Man and early development of artistry techniques.



Education and Outreach

Boise State Participates in Wind Competition

Boise State University was one of 10 schools selected for the inaugural Collegiate Wind Competition held in conjunction with the annual Wind Power conference in Las Vegas. The teams competed in several events including engineering design, performance, business plan and a market issues presentation. The Boise State turbine, nicknamed Turby, was judged the best engineering design.

NUMBER OF EVENTS HELD IN CAES IN 2014

One hundred sixty one

NUMBER OF TOURS GIVEN AT CAES IN 2014

Seventy eight

CAES ENERGY SYSTEMS DESIGN & ANALYSIS LEAD DR. JOHN GARDNER AND BOISE STATE UNIVERSITY ENGINEERING STUDENTS PRESENT TURBY, THE BOISE STATE TURBINE THAT WON BEST ENGINEERING DESIGN AT THE 2014 COLLEGIATE WIND COMPETITION.

Idaho State University Participates in USA Science and Engineering Festival

Idaho State University participated in the 2014 USA Science & Engineering Festival, a national event designed to advance science, technology, engineering, and mathematics education and energize the next generation of scientists and engineers. The Festival was held April 25-27 at the Walter E. Washington Convention Center in Washington, DC, and was visited by an estimated 320,000 people. Idaho State University presented a display, "The Science of Imaging," as part of the expo. The display contained an infrared scanning system used to illustrate the concept of computed tomography for imaging of the human body; a magnetic scanner to demonstrate the future of imaging, and a cloud chamber used to display the tracks of particles given off by radioactive materials.

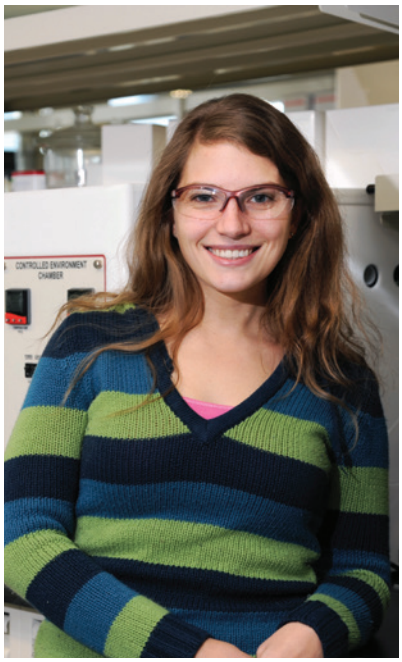
A RESEARCHER USES A TRANSMISSION ELECTRON MICROSCOPE AT IDAHO STATE UNIVERSITY'S RESEARCH AND INNOVATION IN SCIENCE AND ENGINEERING COMPLEX.

CAES Internships

CAES internships provide opportunities for the best and brightest students to further their education by working with world-class scientists and engineers, plus showcase Idaho universities and the Idaho National Laboratory to researchers from around the world. During 2014, 25 interns from universities around the country and one from Korea worked on CAES projects.

DID YOU KNOW?

IN 2014 CAES HOSTED 25 INTERNS FROM 13 U.S. AND INTERNATIONAL INSTITUTIONS



People: Appointments, Awards, and Accomplishments

CAES personnel were recognized in 2014 with a variety of prestigious appointments, invitations, awards and accomplishments.

The American Nuclear Society (ANS) named Idaho State University's **Mary Lou Dunzik-Gougar** as the recipient of this year's **Landis Public Communication and Education Award**, recognizing her dedication to nuclear education and public communication. "Dr. Dunzik-Gougar's passion for the promotion of peaceful nuclear technology is apparent in both her classroom and in her volunteer work," said Dr. Michaele Brady Raap, ANS president. "She constantly pushes herself to find ways to help the public understand and embrace nuclear energy."

Dr. Dunzik-Gougar also received a **Presidential Citation from the ANS** for her visionary leadership as chair of the Communications Committee. She helped the Society to improve communication processes and reach out to new sectors. Dr. Dunzik-Gougar has demonstrated her commitment to improving the Society through her involvement as a member of the Board of Directors, chair of the Fuel Cycle and Waste Management Division, and chair of the Accreditation Policy and Procedures Committee.

Dr. Dunzik-Gougar was selected as the **U.S. Representative** (2011-2014) **for the International Atomic Energy Association (IAEA)** Coordinated Research Project "Treatment of Irradiated Graphite to Meet Acceptance Criteria for Waste Disposal." Dr. Dunzik-Gougar was selected because of her excellent work in this field over the last decade.

Indrajit Charit was also recognized with the **Outstanding Faculty Award** by the University of Idaho College of Engineering for the academic year 2013-2014. Every year this award is given to a University of Idaho engineering faculty who has shown exceptional teaching, research or service performance.

> "Dr. Dunzik-Gougar's passion for the promotion of peaceful nuclear technology is apparent in both her classroom and in her volunteer work."
>
> –Dr. Michaele Brady Raap, ANS President

Indrajit Charit (University of Idaho) was awarded the **American Society for Metals (ASM)-Indian Institute of Metals (IIM) Lectureship Award** in 2014 by ASM International. The visiting lectureship award brings together technically qualified visiting lecturers and the appropriate organizations in India. The program, established in 1979 between ASM and IIM, promotes international cooperation. Annually five awardees are chosen from nominated candidates. ASM International is the world's largest association of metals-centric materials scientists and engineers with over 30,000 members worldwide.

Somayeh Pasebani, a University of Idaho PhD student, won the prestigious **Henry DeWitt Smith Scholarship** given by the American Institute of Mining, Metallurgical and Petroleum Engineers. She was one of only two graduate students chosen for this award in 2014. This award was established in 1967 to assist worthy students in the pursuit of their graduate education in the Mining, Metallurgical, Materials, or Petroleum Departments of leading universities and colleges.

Dr. Kevin Van Den Wymelenberg (University of Idaho) provided daylighting and visual comfort consultation to BNIM Architects and the Iowa Utilities Board (IUB)/ Iowa Office of the Consumer Advocate (OCA) for the LEED Platinum IUB/OCA office building in 2012-2013. The American Institute of Architects Committee on the Environment (AIA-COTE) awarded this building the **2014 Top Ten Plus Award**. This award recognizes one past AIA COTE Top Ten Project Award recipient that has quantifiable metrics of comfort and energy performance that demonstrate the true impact of the design. AIA-COTE has awarded the Top Ten awards to 180 buildings since 1997.

Two journal articles by **Dr. Van Den Wymelenberg** – "A Critical Investigation of Common Lighting Design Metrics for Predicting Human Visual Comfort in Offices with Daylight" and "The Effect of Luminance Distribution Patterns on Occupant Preference in a Daylit Office Environment," – are listed in **LEUKOS' top 10 most cited papers**, one ranking fifth most cited and second most viewed, and the other ranking sixth most cited and third most viewed over the period of June 2011-present (the period for which data are available).

The Electricity Journal published a symposium issue in collaboration with the CAES **Energy Policy Institute** and its recent Fourth Annual Energy Policy Research Conference. Over 125 attendees from industry, national laboratories, academia, government, and non-profits came together to hear a keynote address from former Department of Energy Secretary Stephen Chu and 66 paper presentations. Participants delved into topics such as the future of the electric utility, risk and resilience, grid governance and planning, regional electricity markets and issues with state-level climate policies, renewables integration and curtailment, and real-time pricing for electric vehicles. The Electricity Journal selected nine of the papers to feature in the special issue published in November 2014.

Jason Harris, CAES Associate Director and Idaho State University Associate Professor of Health Physics, **addressed the United Nations** 1540 Committee, a committee under the U.N.'s Security Council, at the U.N. headquarters in New York City. Harris delivered a half-hour talk on the topic of nuclear security and the activities of the International Nuclear Security Education Network, which is a partnership between educational institutions and the International Atomic Energy Agency.

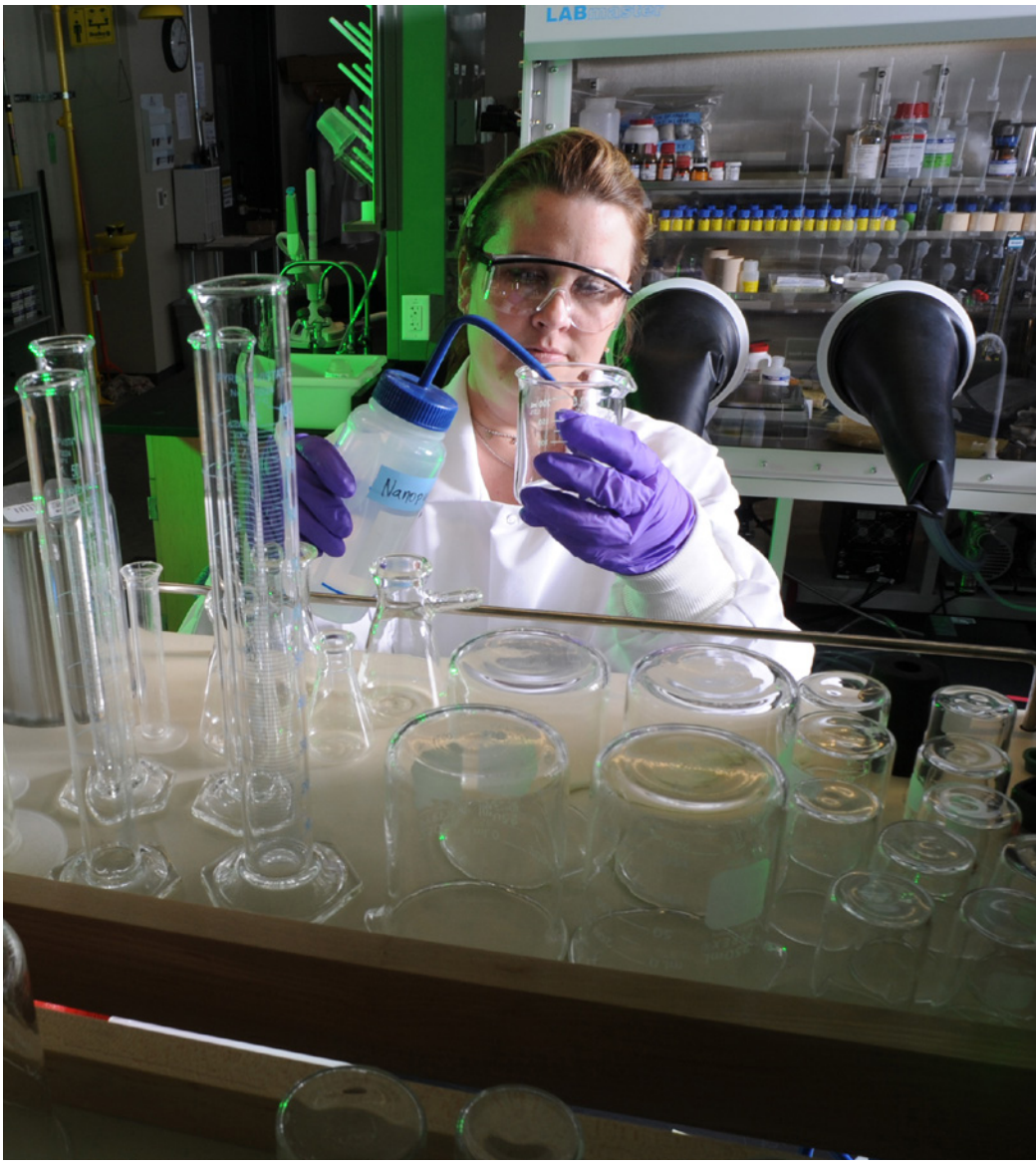
Energy Policy Institute researchers **Juliet Carlisle** (University of Idaho), **Stephanie Kane** (Washington State University), **David Solan** (Boise State University), and **Jeffrey Joe** (Idaho National Laboratory) won the **Charles Redd Award for the Best Paper** on the Politics of the American West. The paper was published in the September 2014 issue of *Energy Research & Social Science* as, "Support for Solar Energy: Examining Sense of Place and Utility-scale Development in California.")

Advancing Industry Competitiveness

CAES continues to partner with industry in the areas of bioenergy, nuclear research, advanced vehicles, and environmental sustainability. During 2014 CAES researchers collaborated with industry partners, such as the Solar Energy Industry Association, Abengoa Solar, REC Solar, and the Solar Electric Power Association, as members of project steering teams, beta testers and review committees. Continued industry collaboration has been important for the successful development of a decision support tool performing utility-scale solar site suitability analyses. These partnerships provided industry increased visibility to research and tools previously unavailable.

Other CAES industry partners include:

- Advanced Ceramic Fibers, Inc.
- AquaSoli
- Aspen Environmental Group
- AWS Truepower
- Ceramatec
- General Atomics
- GMZ
- National Rural Electric Cooperative Association
- Stantec
- Tetra Tech
- Westinghouse



CAES RADIOCHEMISTRY LABORATORY.

Publications, Presentations, & Proceedings

1) ACEEE, "Merging the Power of Simulation with the Simplicity of a Spreadsheet: Heat Pump Savings Calculator," ACEEE Summer Study on Energy Efficient Buildings, 30-minute presentation, Asilomar, CA, August 2014.

2) AIA, "Daylighting Design Development," 60-minute presentation, AIA Idaho Mountain Section, Ketchum, ID, September 2014.

3) AIA, "Daylighting Schematic Design," 60-minute presentation, AIA Idaho Mountain Section, Ketchum, ID, September 2014.

4) AIA, "Integrated Design Case Studies," 60-minute presentation, AIA Idaho Eastern Section, Pocatello, ID, September 2014.

5) AIA, "Integrated Design Principles + 2030 Update," 60-minute presentation, AIA Idaho Central Section, Boise, ID, May 2014.

6) Aijlavajhala, M. S., Y. Gonzalez-Velo, C. Poweleit, H. Barnaby, M. N. Kozicki, K. Holbert, D. P. Butt, and M. Mitkova, "Unraveling the Gamma Radiation Induced Effects in Floppy and Rigid Ge Containing Chalcogenide Thin Films," submitted to J. Appl. Phys., 2014.

7) Aijlavajhala, M. S., Y. Gonzalez-Velo, C. Poweleit, H. Barnaby, M. N. Kozicki, D. P. Butt, and M. Mitkova, 2014, "New Functionality of Chalcogenide Glasses for Radiation Sensing of Nuclear Waste," accepted for publication in J. Hazard. Mater., 2014.

8) Ailavajhala, M. S., T. Nichol, Y. Gonzalez-Velo, C. D. Poweleit, H. J. Barnaby, K. Holbert, M. N. Kozicki, D. P. Butt, and M. Mitkova, "Gamma Radiation Induced Effects in Floppy and Rigid Ge-Containing Chalcogenide Thin Films," J. Appl. Phys., 115, 043502-1/9, 2013.

9) Ailavajhala, M. S., Y. Gonzalez-Velo, C. D. Poweleit, H. J. Barnaby, M. N. Kozicki, D. P. Butt, and M. Mitkova, "Thin Ge-Se Films as a Sensing Material for Radiation Doses," Physica Status Solidi B, 251 [7] 1347-1353, 2014.

10) Alanko G. A., and D. P. Butt, "Mechanochemical Synthesis of Cerium Monosufide," accepted for publication in J. Am. Ceram. Soc., 2014.

11) Alanko, G. A., and D. P. Butt, "Mechanochemical Synthesis of Uranium Sesquisilicide," J. Nucl. Mater., 451, 243-248, 2014.

12) Alanko, G. A., B. J. Jaques, A. Bateman, and D. P. Butt, "Mechanochemical Synthesis and Spark Plasma Sintering of Cerium Silicides," accepted for publication in J. Alloy Compd., 2014.

13) Alanko, G. A., D. Osterberg, B. J. Jaques, M. Hurley, and D. P. Butt, "Reactive Milling of Dysprosium Nitride: A Kinetics Evaluation," accepted for publication in J. Alloy Compd., 2014.

14) Alanko, G., B. J. Jaques, and D. P. Butt, "Synthesis of U3Si2 by High Energy Ball Milling," Presented at the 143rd Annual TMS 2014 Conference, San Diego, CA, February 16 – 20, 2014.

15) Allahar, K. N., J. Burns, B. Jaques, Y. Q. Wu, I. Charit, J. Cole, and D. P. Butt, "Ferritic Oxide Dispersion Strengthen Alloys by Spark Plasma Sintering," accepted for publication in J. Nucl. Mater., 2014.

16) Allahar, K. N., J. Burns, Y. Q. Wu, B. J. Jaques, D. P. Butt, I. Charit, and J. Cole, "Initial Kinetics of Oxide Dispersion Strengthened Alloys Consolidated by Spark Plasma Sintering," Presented at the 143rd Annual TMS 2014 Conference, San Diego, CA, February 16–20, 2014.

17) Allahar, K. N., M. Hurley, E. Sapper, and D. P. Butt, "Simulation of the Relaxation Potential Profile of an ac-dc-ac Test," Intl. J. Corr., 1-12, 819476, 2014.

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